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09/996,120	11/28/2001	Kwong-Yu Chan	609920600024	1508
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PATENT GROUP 2N			EXAMINER	
JONES DAY			WONG, EDNA	
NORTH POINT				
901 LAKESIDE AVENUE			ART UNIT	PAPER NUMBER
CLEVELAND, OH 44114			1753	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/996,120

Applicant(s)

CHAN ET AL.

Examiner

Edna Wong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,7,9-11,13,49-55 and 62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,7,9-11,13,49-55 and 62 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

This is in response to the Amendment dated May 11, 2007. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments

Claim Rejections - 35 USC § 103

I. Claims **1-2, 7-8, 11, 49, 51-55 and 62** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Richter et al.** (US Patent No. 4,126,934) in combination with **WO 98/37997** ('997).

The rejection of claims 1-2, 7-8, 11, 49, 51-55 and 62 under 35 U.S.C. 103(a) as being unpatentable over Richter et al. in combination with WO 98/37997 ('997) has been withdrawn in view of Applicants' amendment.

II. Claims **9, 13 and 50** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Richter et al.** (US Patent No. 4,126,934) in combination with **WO 98/37997** ('997) as applied to claims 1-2, 7-8, 11, 49, 51-55 and 62 above, and further in view of **Katsoulis et al.** (US Patent No. 3,668,014).

The rejection of claims 9, 13 and 50 under 35 U.S.C. 103(a) as being unpatentable over Richter et al. in combination with WO 98/37997 ('997) as applied to claims 1-2, 7-8, 11, 49, 51-55 and 62 above, and further in view of Katsoulis et al. has been withdrawn in view of Applicants' amendment.

III. Claim 10 has been rejected under 35 U.S.C. 103(a) as being unpatentable over **Richter et al.** (US Patent No. 4,126,934) in combination with **WO 98/37997** ('997) as applied to claims 1-2, 7-8, 11, 49, 51-55 and 62 above, and further in view of **Katsoulis et al.** (US Patent No. 3,668,014) as applied to claims 9, 13 and 50 above, and further in view of **Ruetschi** (US Patent No. 3,160,526).

The rejection of claim 10 under 35 U.S.C. 103(a) as being unpatentable over Richter et al. in combination with WO 98/37997 ('997) as applied to claims 1-2, 7-8, 11, 49, 51-55 and 62 above, and further in view of Katsoulis et al. (US Patent No. 3,668,014) as applied to claims 9, 13 and 50 above, and further in view of Ruetschi has been withdrawn in view of Applicants' amendment.

Response to Amendment

Claim Rejections - 35 USC § 112

I. Claims 1-2, 7, 9-11, 13, 49-55 and 62 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1

lines 3-4, recite "cobalt in an amount of about 1 to about 48% by weight of the catalyst".

The amount reads on 0.7% by weight.

However, Applicants' specification discloses that "the Co is about 1.5 to about 48 weight percent of the catalyst composition" (page 7, lines 31-32). Thus, there is insufficient written description to inform a skilled artisan that applicant was in possession of the claimed invention as a whole at the time the application was filed for "an amount of about 1".

The Examiner has carefully considered the entire specification as originally filed, however, there is found no literal support in the specification for the newly added limitations in amended claim 1.

Claim 9

lines 1-2, recite "wherein said catalyst further comprises metal oxides of cobalt".

Claim 1, line 3, recites "said catalyst comprising a mixture of platinum, cobalt in an amount of about 1 to about 48% by weight of the catalyst, and tin".

Thus, claims 1 and 9 read on a catalyst comprising Pt/Co/Sn/Co₃O₄.

However, Applicants' specification discloses "Pt/Co/Co₃O₄" [page 2, line 37; page 3, line 13; page 5, lines 15, 19, 31 and 33; page 8, line 29; and abstract].

Thus, there is insufficient written description to inform a skilled artisan that applicant was in possession of the claimed invention as a whole at the time the application was filed for "wherein said catalyst further comprises metal oxides of cobalt".

Tin was never disclosed in combination with cobalt oxides (see the Pt-Co-Sn in

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the abstract).

The Examiner has carefully considered the entire specification as originally filed, however, there is found no literal support in the specification for the limitations in claim 9.

II. Claim 53 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for glucose molecules, does not reasonably provide enablement for organic molecules. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

Claim 53

lines 1-2, recite "wherein the oxidation converts the organic molecules to gluconic acid".

It does not appear that all organic molecules will oxidize to gluconic acid.

III. Claims 1-2, 7, 9-11, 13, 49-55 and 62 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the electrochemical oxidation step and the organic molecules that oxidize to gluconic acid.

Claim 1

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lines 1-2, recite "to catalyze electrochemical oxidation of the organic molecules".

The "passing" step recited is not an electrochemical oxidation step. There are no electrochemical oxidizing conditions recited in the "passing" step, only that being a function of the passing step.

Claim 53

lines 1-2, recite "wherein the oxidation converts the organic molecules to gluconic acid".

It does not appear that all organic molecules will oxidize to gluconic acid. Thus, the organic molecules that will oxidize to gluconic acid are omitted in the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I. Claims **1, 7, 11, 49 and 51-54** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Dupin et al.** (US Patent No. 4,937,058).

Dupin teaches a method comprising:

passing a solution containing organic molecules over a catalyst (= a gas containing at least one organic sulfur compound is passed over a catalyst) to catalyze

oxidation (col. 1, lines 60-63), said catalyst comprising a mixture of platinum, cobalt, and tin (col. 2, lines 31-38).

The cobalt is present in an oxidation state of 0, 2, $8/3$ or 3 (= elemental cobalt) [col. 2, lines 31-38].

The platinum and the cobalt are mutually discrete (= the atomic ratio of the catalytically active elements present in the catalyst) [col. 3, lines 37-40].

The method of Dupin differs from the instant invention because Dupin does not disclose the following:

- a. Wherein the oxidation is electrochemical oxidation, as recited in claim 1.
- b. Wherein the oxidation of the organic molecules uses the organic molecules as fuel for a fuel cell, as recited in claim 52.

The invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because where Applicants claim a process in terms of a function, property or characteristic and the process of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the function, property or characteristic would have been present in the prior art.

Furthermore, the only method step recited in claim 1 is "passing a solution containing organic molecules over a catalyst". There is nothing electrochemical about this method step.

c. Wherein the cobalt is in an amount of about 1 to about 48% by weight of the catalyst, as recited in claim 1.

d. Wherein said platinum is present in an amount within the range of about 52 to about 99 weight percent of the catalyst, as recited in claim 7.

e. Wherein the tin is not greater than about 10 atom percent of the catalyst, as recited in claim 54.

Dupin teaches that a catalytically effective amount of platinum, cobalt and tin is selected (col. 2, lines 31-38). The percentage by weight of the catalytically active elements present in the catalyst, relative to the zeolite carrier, ranges from about 0.5% to 10% (col. 3, lines 41-44).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the cobalt, platinum and tin described by Dupin with wherein the cobalt is in an amount of about 1 to about 48% by weight of the catalyst; wherein said platinum is present in an amount within the range of about 52 to about 99 weight percent of the catalyst; and wherein the tin is not greater than about 10 atom percent of the catalyst because the amounts of the cobalt, platinum and tin are result-effective variables and one skilled in the art has the skill to calculate the amounts of the cobalt, platinum and tin that would have determined the success of the desired reaction to occur, i.e., catalytically active amounts (MPEP § 2141.03 and § 2144.05(II)(B)).

Furthermore, it has been held that changes in temperature, concentration or

both, is not a patentable modification; however, such changes may impart patentability to a process if the ranges claimed produce new and unexpected results which are different in kind and not merely in degree from results of the prior art, such ranges are termed "critical" ranges and Applicant has the burden of proving such criticality; even though Applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within capabilities of one skilled in the art; more particularly, where general conditions of the claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Aller*, 220 F2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and MPEP § 2144.05.

f. Wherein the organic molecules are glucose molecules, as recited in claim 51.

Dupin teaches a catalyst comprising a mixture of platinum, cobalt and tin (col. 2, lines 31-38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the organic molecules described by Dupin with wherein the organic molecules are glucose molecules because Dupin discloses a method in a similar manner as instantly claimed. Therefore, one having ordinary skill in the art would have expected that glucose molecules would have been oxidized by the method disclosed by Dupin because similar processes can reasonably be expected to

yield similar results.

g. Wherein the oxidation converts the organic molecules to gluconic acid, as recited in claim 53.

The invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because where Applicants claim a process in terms of a function, property or characteristic and the process of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the function, property or characteristic would have been present in the prior art.

Furthermore, claim 1 recites "a solution containing organic molecules". There is nothing specific about the organic molecules that would oxidize into gluconic acid.

II. Claims **2, 55 and 62** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Dupin et al.** (US Patent No. 4,937,058) as applied to claims 1, 7, 11, 49 and 51-54 above, and further in view of **Barbe et al.** ("Nanocrystalline Titanium Oxide Electrodes for Photovoltaic Applications", *J. Am. Ceram. Soc.* (1997), Vol. 80, No. 12, pp. 3157-3171).

Dupin is as applied above and incorporated herein.

The method of Dupin differs from the instant invention because Dupin does not disclose the following:

a. Wherein the catalyst is supported on an electrode, as recited in claim 2.

b. Wherein the catalyst is part of an electrode, as recited in claim 55.

Dupin teaches that the support or carrier comprises titanium oxide (col. 2, lines 8-12).

Barbe teaches that titanium oxide is an electrode material (title and abstract).

The invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because titanium oxide is an electrode material as taught by Barbe (title and abstract). Thus, the catalyst disclosed by Dupin is supported on an electrode.

c. Wherein the electrode functions as an anode in the passing step, as recited in claim 62.

The invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because where Applicants claim a process in terms of a function, property or characteristic and the process of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the function, property or characteristic would have been present in the prior art.

Furthermore, the only method step recited in claim 1 is "passing a solution containing organic molecules over a catalyst". There is nothing electrochemical about this method step.

III. Claims 9-10, 13 and 50 are rejected under 35 U.S.C. 103(a) as being

unpatentable over **Dupin et al.** (US Patent No. 4,937,058) as applied to claims 1, 7, 11, 49 and 51-54 above, and further in view of **Katsoulis et al.** (US Patent No. 3,668,014) and **Ruetschi** (US Patent No. 3,160,526).

Dupin is as applied above and incorporated herein.

The method of Dupin differs from the instant invention because Dupin does not disclose the following:

a. Wherein said catalyst further comprises metal oxides of cobalt, as recited in claim 9.

Dupin teaches a catalyst comprising a mixture of platinum, cobalt and tin (col. 2, lines 31-38).

Katsoulis teaches that an electrocatalyst comprising platinum and cobalt can be of any of the various materials, including pure elements, alloys, mixtures and oxides which will enhance an electrochemical reaction (col. 3, lines 1-15).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the catalyst described by Dupin with wherein said catalyst further comprises metal oxides of cobalt because any of the various materials, including pure elements, alloys, mixtures and oxides would have been functionally equivalent as a catalyst as taught by Katsoulis (col. 3, lines 1-15).

b. Wherein said metal oxides are the products of reactive electrodeposition, as recited in claim 10.

Ruetschi teaches that it is known in the art that cobalt metal can be oxidized anodically in alkaline electrolyte to cobalt oxides (col. 1, lines 20-28).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the metal oxides described by Katsoulis with wherein said metal oxides are the products of reactive electrodeposition because it is known in the art that cobalt metal can be oxidized anodically in alkaline electrolyte to cobalt oxides as taught by Ruetschi (col. 1, lines 20-21).

c. Wherein said catalyst further comprises a mixture of carbon and polytetrafluoroethylene, as recited in claim 13.

d. Wherein the platinum and the cobalt are in the form of platinum particles and cobalt particles, as recited in claim 50.

Dupin teaches that the catalyst can be prepared in accordance with conventional processes and in particular by impregnating a support based on titanium oxide, silica, zirconium oxide, silica-magnesia, silica-zirconia, silica-titanium oxide, zirconia-titanium oxide or zeolite with the catalytically active elements or suitable precursors thereof (col. 3, lines 1-10).

Katsoulis teaches a method of impregnation of a suitable matrix with suspensions and solutions of a catalytic metal (col. 3, lines 25-49). The catalytic metal may be introduced as a powder in a suspending medium or as a dissolved compound in which the metal is present as a cation or as part of an anion. The dispersion may be

filtered through or sprayed onto the matrix such that the powder deposits on the fibers (col. 2, lines 33-72).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the catalyst described by Richter with wherein said catalyst further comprises a mixture of carbon and polytetrafluoroethylene; and wherein the platinum and the cobalt are in the form of platinum particles and cobalt particles because this is a conventional process of impregnating a support with a catalytic metal as taught by Katsoulis (col. 2, lines 33-72; and col. 3, lines 1-10).

Citations

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

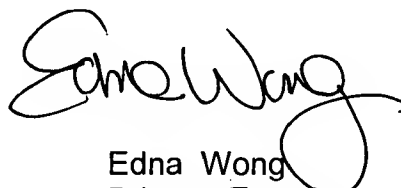
Sato et al. (US Patent No. 4,297,195) is cited to teach an electrode comprising platinum, tin oxide and cobalt oxide (col. 2, lines 14-23)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Edna Wong
Primary Examiner
Art Unit 1753

EW
June 2, 2007